

M I C R O B I O L O G Y

PREPARATION FOR THE MAJOR

High School Preparation

Recommended as part of or in addition to UC's "a-g" admission requirements:

**One year of biology,
One year of chemistry,
Mathematics through
trigonometry,
One year of physics.**

Transfer Preparation

**The following courses are
required prior to transfer,
with a minimum GPA of 2.7
or higher:**

**One year sequence of general
chemistry with laboratory,
and one sequence (2-3 terms)
of general biology.**

**To make normal progress in
the major, it is also strongly
recommended that students
complete all of the following
courses prior to transfer:**

**Two terms of calculus and one
term of statistics:**

**Two terms of organic chemistry
with laboratory,**

**One-year sequence of physics
with laboratory.**

Please see the UCSB *General Catalog*
(www.catalog.ucsb.edu) or
your school counselor for more
information on course preparation.
California community college
students should see www.assist.org.

Microbiology is the study of the properties, characteristics, and interactions of microorganisms and their effects on other organisms and the environment. Microbiology has been and continues to be at the forefront of those fields and technologies that contribute to human welfare and to our understanding of the basic mechanisms of life processes.

The Department

The Department of Molecular, Cellular, and Developmental Biology, of which the Microbiology major is a part, is one of the largest on campus. In addition to the Bachelor of Science (BS) degree in Microbiology, the department offers majors in Biological Sciences, Biochemistry-Molecular Biology, Cell and Developmental Biology, and Pharmacology. The diverse 21-member faculty offers approximately 50 upper-division (junior and senior) courses. These courses include lectures, laboratories, seminars, and independent research projects.

The Major

Students may select one of three emphases within the Microbiology major: General Microbiology, Biomedical Sciences, or Genetic Engineering.

General Microbiology: Provides students with a broad knowledge base regarding the fundamental principles and diversity of microorganisms. These studies emphasize the contribution of microbiology to our basic understanding of fundamental life processes and provide insight into how microbiology impacts our everyday lives. Additionally, this knowledge base prepares students for graduate work and careers in food, industrial, marine, and pharmacological microbiology.

Biomedical Sciences: Provides general training in microbiology and specialized instruction in the fundamental principles of pathogenic microorganisms. Presently, emerging infectious diseases pose a major threat to world health and contribute to increased health care costs. Training in biomedical sciences offers many career opportunities in biomedical fields such as clinical microbiology, medical technology, medicine, and public health.

Genetic Engineering: Provides general training in microbiology and specialized training in the methodology of recombinant DNA research. Students are exposed to state-of-the-art techniques in biotechnology, including DNA sequencing, gene cloning, and the polymerase chain reaction (PCR). This training is directly applicable to careers in the new and expanding fields of biotechnology, biomedical research, and clinical microbiology.

The Requirements

Students planning to major in microbiology enter UCSB as Pre-Biological Sciences majors and take a common core curriculum consisting of introductory biology, general chemistry, mathematics, physics, and organic chemistry. Students should complete this preparatory work in their freshman and sophomore years. Following successful completion of a subset of these courses, students may advance from pre-biology to full major status.

The Microbiology major requires completion of upper-division coursework in genetics, microbiology, biochemistry, immunology, and virology. Students also must take elective coursework in one of three emphases. Electives are available in the areas of mycology (the study of fungi), marine microbiology, medical microbiology, parasitology, and recombinant DNA methods.

Careers in Microbiology

Microbiology is a dynamic field which has grown rapidly with regard to both fundamental knowledge and its application to medicine, agriculture, and industry. Dozens of biotechnology companies, formed to exploit these advances, provide employment for students with suitable training at the bachelor's level. New industries devoted to genetic engineering offer microbiologists excellent career opportunities. Microbiologists are also in great demand in clinical microbiology.

Students interested in the health sciences and related professions can take advantage of the University's excellent health sciences advising office. They can seek advice and support from the beginning of their studies in biology up to their entrance into health sciences graduate programs and professional schools.

Students interested in teaching biological sciences and conducting research at a university should plan to complete the PhD degree. Students interested in teaching at a community college should pursue graduate work at least through the master's degree. Teaching at the junior or senior high school (secondary) level requires the California Single Subject Teaching Credential. Students considering this last option should discuss their plans with the credential advisor in UCSB's Graduate School of Education early in their academic careers.

For more information about UCSB's Microbiology major, call or write to the department's undergraduate advisor at:

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